

U.S. Patent Application Serial No. 09/817,366
Response dated August 25, 2004
Reply to OA of February 25, 2004

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A method of fabricating a temperature control device ~~[[1]]~~ equipped with a temperature control element ~~[[2]]~~ configured by soft-soldering a thermionic element ~~[[9]]~~ between a pair of opposed electrodes ~~(7) and (8)~~ and a pair of heat conduction plates ~~(3) and (4)~~ disposed respectively on outside surfaces of respective insulating substrates ~~(5) and (6)~~ of the temperature control element ~~[[2]]~~ of ~~the relevant~~ a temperature control device,

said pairs of electrodes ~~(7) and (8)~~ are formed respectively on opposing surfaces of a pair of insulating substrates ~~(5) and (6)~~ disposed in opposed positions,

at least one plate ~~[[4]]~~ of said pair of heat conduction plates ~~(3) and (4)~~ is disposed on an outside surface of one of the insulating substrates ~~[[6]]~~ after soft soldering is performed with said thermionic element ~~[[9]]~~,

said one of the insulating substrates ~~[[6]]~~ on which said at least one plate ~~[[4]]~~ is disposed after soft soldering is flexible, and

in said soft soldering of thermionic element ~~[[9]]~~, a soft solder ~~[[12]]~~ in which a layer thickness control member is mixed ~~is used and is performed~~ while adding a predetermined pressure.

U.S. Patent Application Serial No. 09/817,366
Response dated August 25, 2004
Reply to OA of February 25, 2004

Claim 2 (Currently Amended): A method of fabricating a temperature control device ~~[[1]]~~ equipped with a temperature control element ~~[[2]]~~ configured by soft-soldering a thermionic element ~~[[9]]~~ between a pair of opposed electrodes ~~(7) and (8)~~ and a pair of heat conduction plates ~~(3) and (4)~~ disposed respectively on outside surfaces of respective insulating substrates ~~(5) and (6)~~ of the relevant ~~a~~ temperature control element ~~[[2]]~~,

the pair of electrodes ~~(7) and (8)~~ are formed respectively on opposing surfaces of a pair of insulating substrates ~~(5) and (6)~~ disposed in opposed positions,

at least one plate ~~[[4]]~~ of said pair of heat conduction plates ~~(3) and (4)~~ is disposed on an outside surface of one of the insulating substrates ~~[[6]]~~ after soft soldering is performed,

said one of the insulating substrates ~~[[6]]~~ on which said at least one plate ~~[[4]]~~ is disposed after soft soldering is flexible and

after soft soldering of said thermionic element ~~[[9]]~~ is performed, a soft solder layer ~~[[12a]]~~ is flattened by adding a pressure multiplied by 0.8 - 1.5 of yield stress at a temperature; ~~as well as and~~ said soft solder layer ~~[[12a]]~~ is heated to a first temperature which is the fusing point of a soft solder or to a temperature less than said first temperature and a second temperature which is the apparent initial softening point of a soft solder or to a temperature more than said second temperature.

U.S. Patent Application Serial No. 09/817,366
Response dated August 25, 2004
Reply to OA of February 25, 2004

Claim 3 (Currently Amended): The method of fabricating a temperature control device according to claim 2, wherein said soft solder layer ~~[(12a)]~~ contains a layer thickness control member.

Claim 4 (Currently Amended): A method of fabricating a temperature control device ~~[(1)]~~ equipped with a temperature control element ~~[(2)]~~ configured by soft-soldering a thermionic element ~~[(9)]~~ between a pair of opposed electrodes ~~(7) and (8)~~ and a pair of heat conduction plates ~~(3) and (4)~~ disposed respectively on outside surfaces of respective insulating substrates ~~(5) and (6)~~ of ~~the relevant~~ a temperature control element ~~[(2)]~~,

the pair of electrodes ~~(7) and (8)~~ are formed respectively on opposing surfaces of a pair of insulating substrates ~~(5) and (6)~~ disposed in opposed positions,

at least one plate ~~[(4)]~~ of said pair of heat conduction plates ~~(3) and (4)~~ is disposed on an outside surface of one of said pairs of insulating substrates ~~[(6)]~~ by making a grease layer ~~(10)~~ stood between provided therebetween,

the one of said pair of substrates ~~[(6)]~~ on which said at least one plate ~~[(4)]~~ is disposed, by making providing the grease layer ~~(10)~~ stood between therebetween, is flexible,

after said at least one plate ~~[(4)]~~ is disposed by making providing the grease layer ~~(10)~~ stood between the relevant plate ~~[(4)]~~ and one of said pair of insulating substrate ~~[(6)]~~, said grease layer ~~[(10)]~~ is flattened by adding a pressure in a range from 0.6 - 10 kg / cm² as well as heating in a range from 120-170 °C.

U.S. Patent Application Serial No. 09/817,366
Response dated August 25, 2004
Reply to OA of February 25, 2004

Claim 5 (Currently Amended): The method of fabricating a temperature control device according to claim 4, wherein after soft soldering of said thermionic element $[(9)]$ is performed, $[\text{said}]$ a soft solder layer $[(12a)]$ is flattened by heating $[\text{a}]$ said soft solder layer $[(12a)]$ to a first temperature which is the fusing point of a soft solder or to a temperature less than said first temperature and a second temperature which is the apparent initial softening point of a soft solder or to a temperature more than said second temperature;

adding a pressure multiplied by 0.8 - 1.5 of yield stress at a relevant temperature, and
flattening of said grease layer $[(10)]$ and the flattening of said soft solder layer $[(12a)]$ are carried out in the same time period.

Claim 6 (Currently Amended): The method of fabricating a temperature control device according to claim 5, wherein prior to soft soldering of said thermionic element $[(9)]$, a heat conduction plate $[(4)]$ is disposed by making providing the grease layer ~~(10)~~ stood between the relevant plate $[(4)]$ and an insulating substrate $[(6)]$.

Claim 7 (Currently Amended): The method of fabricating a temperature control device according to claim 5, wherein after soft soldering of said thermionic element $[(9)]$ is performed, a heat conduction plate $[(4)]$ is disposed by making providing the grease layer ~~(10)~~ stood between the relevant plate $[(4)]$ and an insulating substrate $[(6)]$.